# Temporary Forbearance of a Water Right Entitlement Held by the Orange Cove Irrigation District on Mill Creek, Tehama County, California

# Draft Environmental Assessment

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**Draft Environmental Assessment**
**For The**
**Temporary Forbearance of a Water Right Entitlement Held by the Orange Cove Irrigation District on Mill Creek, Tehama County, California**

Lead Agencies: U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region, Sacramento, California

Cooperating Agencies: U.S. Fish and Wildlife Service; National Marine Fisheries Service.

This Draft Environmental Assessment (DEA) has been prepared in compliance with the National Environmental Policy Act (NEPA), and the U.S. Bureau of Reclamation (USBR) procedures for NEPA compliance.

USBR has prepared this DEA for a project in which the Orange Cove Irrigation District (OCID) would forego its right to divert water from Mill Creek to increase instream flows for the purpose of restoring and enhancing salmon fishery on Mill Creek. The Proposed Action is in accordance with recommendations contained in the Anadromous Fish Restoration Program (AFRP) (USFWS 1997) under the Central Valley Project Improvement Act (CVPIA). OCID has secured water rights for this purpose and has entered into a cooperative agreement with Los Molinos Mutual Water Company (LMMWC), the local irrigation water purveyor and watermaster on Mill Creek.

The DEA examines the Proposed Action that was determined to meet the Proposed Action's purpose and need and the federal authority of the project pursuant to the CVPIA. Section 3406 (b)(1) of CVPIA requires the development and implementation of a program (AFRP) that will make all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable on a long-term basis, at levels that are at least twice the average levels attained during the period 1967-1991. Water may be purchased by USBR to meet fish and wildlife needs within the Sacramento River and Bay/Delta river system under the authority of Sections 3406 (b)(3) of CVPIA. Section (b)(3) provides for the acquisition of water from willing sellers on the streams for the following two specific purposes: "...to supplement the quantity of water dedicated to fish and wildlife purposes under Section 3406 (b)(2)... and to fulfill the Secretary's obligation under Section 3406 (d)(2)..." Water obtained from willing sellers would be used to provide increased in-stream flows in specific months to improve habitat, in accordance with preliminary information developed by the AFRP.

The Proposed Action is located in Tehama County, California.

For further information regarding this DEA, contact the following:

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Filing Date: _____

Comments on DEA must be provided by: _____

# Draft Environmental Assessment

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Temporary Forbearance of a Water Right Entitlement Held by the Orange Cove Irrigation District on Mill Creek, Tehama County, California

# DRAFT ENVIRONMENTAL ASSESSMENT

## 1.0 PURPOSE AND NEED

### 1.1 Introduction

This Draft Environmental Assessment (DEA) addresses and analyzes relevant environmental issues associated with temporary forbearance of a water right held by the Orange Cove Irrigation District (OCID) on Mill Creek in Tehama County, California. OCID and the U.S. Bureau of Reclamation (USBR) propose to increase instream flows during the migration periods of anadromous fish by OCID's forbearance of water right entitlements to divert water from Mill Creek as allowed under the 1920 Mill Creek Adjudication Decree (Decree). USBR intends to compensate OCID for not exercising its water right entitlements during the fish migration periods. This DEA is intended to meet disclosure requirements of the National Environmental Policy Act (NEPA), and to inform federal, state, and local decision-makers and the public.

The Central Valley Project Improvement Act (CVPIA), signed into law on October 30, 1992, as Title 34 of Public Law 102-575, mandated changes in Central Valley Project (CVP) management to include the protection, restoration and enhancement of fish and wildlife habitat. Section 3406(b)(1) of the CVPIA requires the development of a program that will make all reasonable efforts to ensure that, by the year 2002, the natural production of anadromous fish in the Central Valley rivers and streams will be sustainable on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991. To meet this requirement, the USBR and U.S. Fish and Wildlife Service (USFWS) have developed the Anadromous Fish Restoration Program (AFRP). The AFRP production target for spring-run chinook salmon in Mill Creek is 4,400 naturally produced adult fish based on doubling the baseline of 2,200 adult fish presented in the 1995-1997 Comprehensive Assessment and Monitoring Program (CAMP) Annual Report (USFWS, 1998).

The USFWS released a Revised Draft Restoration Plan (Restoration Plan) May 30, 1997, to guide the long-term development of the AFRP (USFWS 1997a). The Restoration Plan presents a programmatic-level description of the AFRP. In broad and general terms, it states the goals, objectives, and strategies of the AFRP. It describes how the AFRP identified and prioritized reasonable actions and evaluations that are already underway or that may be implemented in the near future for various rivers and streams of the Central Valley. Mill Creek is one of the tributaries identified in the Restoration Plan as having exceptionally high restoration potential, particularly for spring-run chinook salmon. Mill Creek is also noted in the Restoration Plan as a stream with a high priority for protection and enhancement.

The Restoration Plan and The Working Paper on Restoration Needs (USFWS 1995a) identify five limiting factors that need resolution to enable restoration and enhancement of Mill Creek. Those limiting factors are:

- Inadequate transport flows on the valley floor;
- Improved passage at Clough Dam;
- Land use impacts in the upper watershed;
- Armored spawning gravel on the valley floor; and
- Degraded habitat on valley floor.

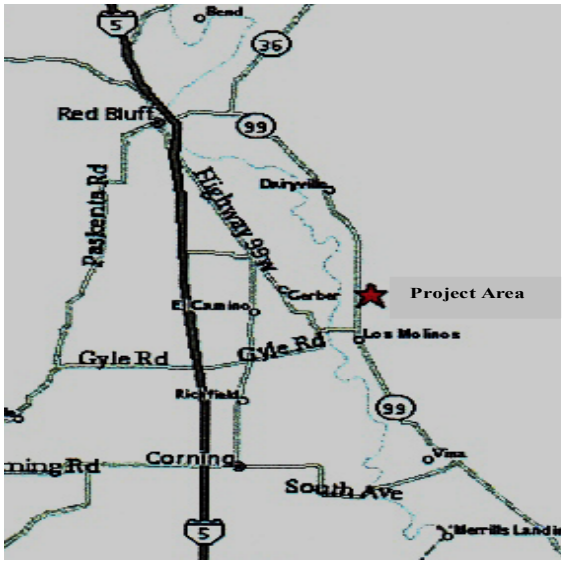
The CVPIA directs the AFRP to give first priority to measures that protect and restore natural channel and riparian habitat values. Further, the Working Paper on Restoration Needs states in Volume 3, page 3-Xb-39 that "Inadequate transportation flows during critical migration periods (April, May, June and after October 15) have largely been alleviated due to negotiated exchange agreements between the Los Molinos Mutual Water Company (LMMWC), The Nature Conservancy (TNC), water rights holders on Mill Creek, and state agencies. Central to these agreements are minimum base flow requirements of approximately 25 cfs and the flexibility to adapt management of in-stream flows to fishery needs. In addition, subsequent CDFG and independent studies have confirmed that greater flows are required at critical riffle locations in lower Mill Creek."

The CDFG "Report to the Fish and Game Commission: A Status Review of the Spring-Run Chinook Salmon (*Onchorhynchus tshawytscha*) in the Sacramento River Drainage" (CDFG, 1998) cited Mill Creek as an important tributary of the Sacramento River that supports spring-run chinook salmon. The Report recognizes the need for additional flows during certain hydrological conditions at critical riffle sites in lower Mill Creek to aid spring-run chinook adult migration.

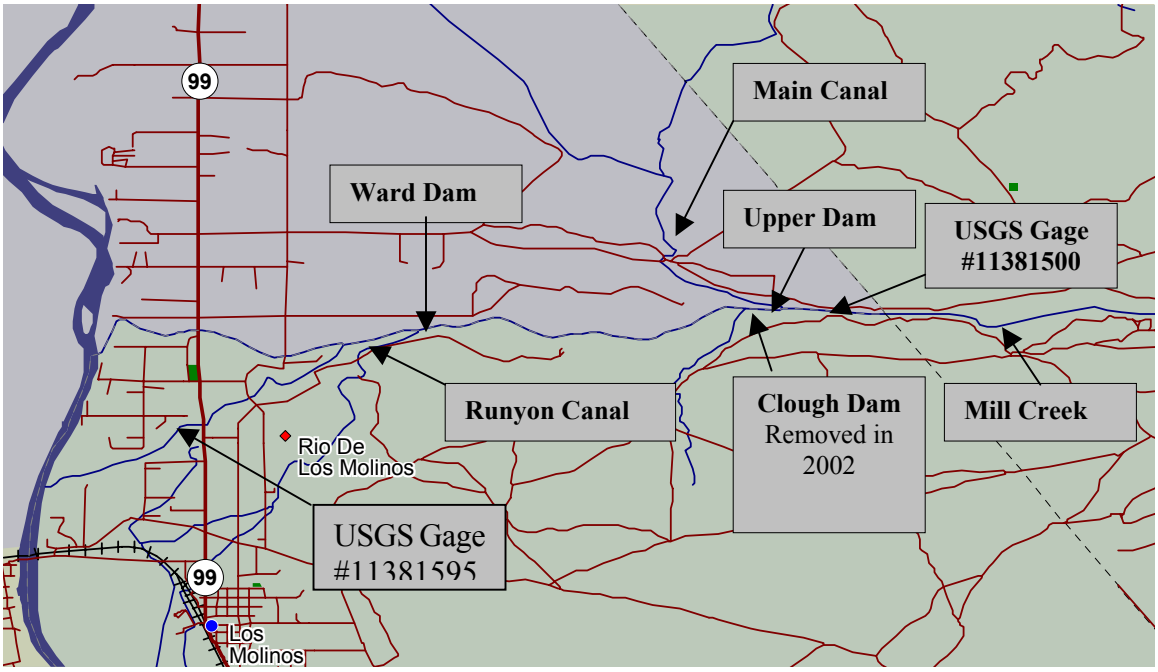
The "Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes" (USFWS, 1995b) states that "the only essentially wild populations of spring run chinook remaining in California are in Deer and Mill Creeks in the Sacramento drainage. During wet or normal years, natural flows are sufficient to enable salmon to surmount diversion dams in lower reaches of these streams and reach holding pools. In dry years, however, diversions of water for irrigation may decrease flows in the lower reaches to such an extent that adults are unable to negotiate dams".

Mill Creek anadromous fish populations have benefited from the LMMWC, CDFG and California Department Water Resources (CDWR) water exchange programs. These programs provide additional in-stream flow during critical periods when salmon and steelhead migrate. However, these flows need to be augmented to ensure proper hydrologic conditions that generate environmental cues to facilitate successful salmonid migration.

**Location Map**




**Area Map**




**Mill Creek Watershed Map**

**1.2 Background**

Mill Creek originates on the southern slopes of Lassen Peak in Tehama County, California at an approximate elevation of 8,000 feet. It flows to its confluence with the Sacramento River at an approximate elevation of 200 feet, adjacent to the unincorporated community of Los Molinos. The watershed drains approximately 134 square miles through a stream length of about 60 miles. The stream has several unique features that include its course through steep-sided canyons. These make Mill Creek relatively inaccessible in the upper watershed and provide some of the highest elevation spawning habitat for chinook salmon known in North America.

Mill Creek is one of the few Sacramento River tributaries that support wild spring-run chinook salmon and designation as critical habitat has been proposed in Mill Creek pursuant to Federal Endangered Species Act (ESA) for the Central Valley spring-run ESU. ESU's identify distinct population segments and are subject to federal ESA requirements.

Habitat in upper Mill Creek is considered excellent for spring-run holding, spawning and early life stage development. The juvenile and adult spring-run migration will typically commence in March with the predominant run complete by mid-June. However, flows in the lowermost portions of Mill Creek are often inadequate during biologically critical periods, and the supplemental flows provided by LMMMWC and CDFG are insecure being dependent on continuing appropriations and extensions of the cooperative agreement.

Mill Creek also supports fall-run chinook salmon that typically commence adult upstream migration about mid-October. However, improved passage is needed for migrating juvenile and adult salmon during late spring and early summer months when low flows may cause in-stream barriers. Improved passage is also needed for migration of fall-run chinook adult salmon during periods of low flows in the fall.

The Superior Court of Tehama County, by its Decree of August 16, 1920 (See Appendix I), adjudicated entitlements to all flows below 203 cubic feet per second (cfs) in Mill Creek to serve 8,500 acres of agricultural lands based upon their riparian and appropriated water rights at that time. LMMWC was appointed to serve as the Watermaster to administer the Mill Creek water rights. The water is diverted as needed by water users to irrigate their crops in accordance with the Decree. OCID has acquired two rights, the Patrick right (2 %) and the Smith/Wood right (3.5%), which represent a diversion right with a maximum face value of approximately 11 cfs.

Three small diversion structures on lower Mill Creek divert agricultural water. The Upper Dam, located approximately 5 river miles from the confluence of Mill Creek and the Sacramento River, diverts agricultural water to the north. The Clough and Ward Dams, located respectively approximately 4.5 and 2.5 river miles from the confluence, divert agricultural water to the south. LMMWC operates all three dams.

Adequate fish screens and fish ladders, in place for many years at each diversion structure, are operated and maintained by CDFG. Upper and Ward Dams also have sloping downstream faces over which salmon can swim when water tops the dam's crest. The Clough Dam, which had been targeted by the AFRP and ERP for fish passage improvements, was damaged and rendered obsolete by flood flows in 1997. The dam was removed in 2002 under a CALFED program that is not part of this project. A new outlet structure from LMMWC's Main Canal north of the creek has been constructed. The diverted water has been siphoned under the creek. The AFRP and ERP goals to improve chinook salmon migration at Clough Dam will be achieved with removal of the dam, leaving inadequate flows as the major concern in the Mill Creek watershed.

LMMWC has historically cooperated with CDFG to limit the exercise of Mill Creek water rights when water is needed to provide transport flows below Ward Dam, and to maintain flows in the fish ladder at Ward Dam. In addition, LMMWC and CDFG lease water from a Mill Creek water right holder in order to provide additional in-stream flows to enhance salmon migration in lower Mill Creek. This water lease is part of an agreement between LMMWC, CDFG, and CDWR (See Appendix II) to operate and maintain a Fisheries Restoration Project on Mill Creek.

The existing Fisheries Restoration Project on Mill Creek, which relies on exchange water from LMMWC's water right on Mill Creek, and includes the leases of about 7 percent of the Decree yield to augment in-stream flows as determined in consultation with CDFG. When LMMWC's water right is used for these increases, CDWR pumps groundwater from two wells into LMMWC canals in exchange for the water used from the LMMWC water right. The Fisheries Restoration Project agreement provides for a well capacity of 25 cfs but only 12 cfs has been developed to date. The water right lease provides the additional 13 cfs for the program.

LMMWC, CDFG and CDWR have demonstrated, through these operations over past years, that manipulation of spring pulse flows in addition to adequate transportation flows has resulted in suitable, temporary, hydrologic and geomorphic conditions for juvenile and adult chinook salmon passage. Spring-run pulse flows appear to generate positive environmental cues to enhance the migration. Additional benefits may have resulted from reduction in adult salmon straying to the Sacramento River and other tributaries. However, it is recognized that these steps have not provided the desired quantity of assured flow conditions for reliable salmon transportation in the drier water years. The current agreements and operations by LMMWC and CDFG target a base in-stream flow of 25 cfs below Ward Dam in the April through June period, but the experience of LMMWC and CDFG has shown that in-stream flows greater than 25 cfs below Ward Dam would be more desirable than the current operations.

USFWS instream flow analysis (USFWS, February 2002) indicates that approximately 157 cfs would be the minimum flow rate required for the safe passage of spring-run and fall-run chinook salmon below Ward Dam, based on the current channel configuration. USFWS has also determined that, if channel modifications were made to the critical riffles in Mill Creek below Ward Dam, the minimum flow rate would be approximately 57 cfs. Dry year bypass flows were not addressed in the analysis, but the 57cfs would probably still be the minimum flow necessary to pass adult chinook salmon.

### 1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to further enhance the in-stream flows in Mill Creek below Ward Dam through the forbearance of OCID's water rights. The additional in-stream flows are needed to enable upstream migrating spring-run adult chinook salmon, downstream migrating spring-run juvenile salmon, fall-run adult chinook salmon, and steelhead migrate safely through the lower portion of Mill Creek in below average and dry water years.

### 1.4 Authority for the Proposed Action

USBR's authority for this Proposed Action is CVPIA Section 3406 (b)(1), previously described in Section 1.1 (Introduction) of this EA, and Section 3406(b)(3), which authorizes USBR to purchase water to meet fish and wildlife needs within the San Francisco Bay and Sacramento and San Joaquin River Delta system. Section 3406 (b)(3) provides for the acquisition of water from willing sellers. It states two specific purposes: "...to supplement the quantity of water dedicated to fish and wildlife purposes under Section 3406 (b)(2)... and to fulfill the Secretary's obligation under Section 3406 (d)(2)…". Water obtained from willing sellers would be used to provide increased in-stream flows in specific months to improve habitat in accordance with the AFRP.

### 1.5 Related Actions and Ongoing Programs

Coordinated AB 3030 Groundwater Management Plan, November 20, 1996, prepared for Tehama County Flood Control and Water Conservation District.

Tehama County Code Title 9 Chapter 7.40 Aquifer Protection enacted by Ordinance 1617, dated January 18, 1994.

LMMWC, CDFG and CDWR agreement for construction, operation and maintenance of a Fisheries Restoration Project on Mill Creek, commencing May 1, 1990, (Appendix II).

LMMWC and CDFG water right lease with an individual water right holder to enhance salmon migration, dated March 1, 1996, (Appendix II).

CDFG Mill Creek fish counting program throughout the Mill Creek watershed.

CDFG Mill Creek fish screen maintenance program at the diversion points in lower Mill Creek.

CDWR groundwater level-monitoring program in the Sacramento Valley Groundwater Basin, Tehama County.

The Mill Creek Conservancy's annual adoption of a 4-year Implementation/Work program that reflects the priorities consistent with the enhancement of the Mill Creek ecosystem.

# 2.0 ALTERNATIVES

## 2.1 Proposed Action

The Proposed Action is a short-term (5-year) project consisting of the temporary forbearance of OCID's water right entitlement on Mill Creek to enhance in-stream flows in lower Mill Creek. The enhanced in-stream flows are needed to support juvenile and adult chinook salmon migration and survival. The Proposed Action helps achieve the AFRP objectives to improve transportation flows in lower Mill Creek, thereby enabling the migration of spring-run chinook salmon and fall-run chinook salmon. OCID's water entitlement had been previously diverted for irrigation purposes.

OCID 's water right entitlement on Mill Creek equals 5.5% (11cfs or 2,657 acre-feet) of the 203 cfs allocated under the Decree (Appendix I). In addition, OCID may have the option of making available for forbearance another 2.0% (4 cfs or 966 acre-feet) water right under the Decree through a separate exchange agreement with LMMWC. This water, if made available, would supplement OCID's own water right entitlement of 5.5%. Therefore, the combined total quantity of water made available by OCID for instream purposes would be 7.5 % (15 cfs) of the Decree, or up to a maximum quantity of 3,623 acre-feet.

The environmental water for enhancing instream flows in Mill Creek would come from the forbearance of water right entitlements under the Decree. The water held under this right was historically diverted for the irrigation of approximately 300 acres of walnut and prune orchards. The water would be dedicated to in-stream use for salmon runs from April through June and October of each year during the 5-year project. The amount of available water resulting from the Proposed Action would vary by water year type and in some years may not be fully adequate for fishery enhancement. However, even under these conditions the increased in-stream flows might provide some benefit for fish passage.

OCID's water right entitlement not used for instream flow purposes in March, July through September, and November would be available for diversion by LMMWC to meet existing irrigation demands and to provide a more reliable water supply. LMMWC would not be changing their irrigation patterns or irrigating any additional acreage with the water provided under OCID's entitlement.

The Proposed Action is a “performance project” whereby the USBR would compensate OCID based on the amount of their Mill Creek water right entitlement available for in-stream use in Mill Creek to help enhance salmon migration. The USBR would make payments to OCID under a performance contract agreement so long as OCID performs under the terms of the agreement.

The Proposed Action is consistent with the existing exchange and lease agreements that the CDFG and CDWR have engaged in to enhance Mill Creek flows (Appendix II).

## 2.2 No-Action Alternative

Under the No-Action Alternative, the current operations by LMMWC and CDFG that target a base in-stream flow of 25 cfs below Ward Dam in the April through June period would continue as long as the present exchange agreements are in place. Salmonid passage and migration with a base in-stream flow of 25 cfs or less below Ward Dam may compromise Mill Creek restoration. Should those agreements terminate, the salmon runs could be adversely impacted.

## 2.3 Alternatives Considered But Eliminated From Detailed Study

Other water supply alternatives were studied in addition to the Proposed Action. OCID had initiated negotiations with water rights holders for the right to purchase an additional 1.5% of the water rights on Mill Creek, amounting to a total of 7% of the Decree. However, the water right holders to these rights decided not to sell. OCID decided to drop the option to purchase additional water rights for the project due to the unavailability of such additional water rights.

OCID and LMMWC studied conjunctive use of surface and groundwater to increase the water supply of the Proposed Alternative. The proposal was to install new groundwater wells that would pump groundwater into LMMWC canals in exchange for LMMWC's water right in Mill Creek. The proposal was eliminated when it became known that a detailed study of the groundwater basin was required to satisfy County and local landowner concerns. Such a concept may be feasible to study at a later date.

Another alternative investigated by Reclamation and OCID was the direct purchase of OCID" s water right by the U.S. Department of the Interior for instream flows. However, this alternative was eliminated from further consideration due to the difficulty in assessing the true market value of a water right purchased for instream purposes. In most cases, the purchase of a water right is tied to the sale of and included in the market value of the land. Seldom is a water right purchased independent of the land.

## 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the resources that have the potential to be affected by implementing the project alternatives. Additionally, it describes how those resources may be impacted.

### 3.1 Physical Factors

#### 3.1.1 Surface Water

Affected Environment

The average annual runoff for Mill Creek is 219,420 acre-feet. The wettest calendar year of record occurred in 1983 with a runoff of 450,450 acre-feet. The driest calendar year of record occurred in 1977 with a runoff of 81,330 acre-feet. The day with the highest daily flow, 12,800 cfs at the gage, occurred on December 22, 1964. The days with the lowest daily flow, 52 cfs at the U. S. Geological Survey (USGS) stream gage, number 11381500, occurred on December 12 and December 13, 1932 (Appendix III).

The Decree appropriated water entitlements to all flows below 203 cubic feet per second (cfs) to serve 8,500 acres of agricultural lands based upon their riparian and appropriated water rights at that time. Under the Decree, there is no specified location from where the water right may be diverted along Mill Creek. The water rights under the Decree are correlative. This means that to the extent one party to the adjudication does not utilize adjudicated rights, those waters are available, to the extent of their reasonable and beneficial use, to other parties to the adjudication, including LMMWC, up to the limits of their allocation. Also, the water right is considered real property and is not pertinent to the water right holder's land.

Environmental water for this project would come from water currently diverted or available for diversion for irrigation purposes above Ward Dam on Mill Creek. Such flows would be committed to in-stream use during periods of chinook salmon runs. The irrigation season for the Los Molinos area may run from early March to mid-November depending on weather conditions. The juvenile and adult spring-run and fall-run chinook salmon are the primary salmon runs that will be enhanced by the Proposed Action. The juvenile and adult spring-run migration will typically commence in March with the predominant run complete by mid-June. The fall-run typically will commence about mid-October, which may overlap the last month of the irrigation season. The water right purchased by OCID in the mid-June through mid-October period will be available to LMMWC to divert to meet existing irrigation demands. LMMWC would not be changing their irrigation patterns or irrigating any additional acreages. The purpose of the Proposed Action is to increase in-stream flows for salmon runs without causing economic harm to the Decree holders on Mill Creek.

Groundwater developed for this project by water right holders would not be pumped directly into Mill Creek. The groundwater would be applied directly to the land for crops.

Increasing in-stream flows below Ward Dam primarily represents a dry season flow increase since wet season flows typically exceed these values. Since the dry season flow increase would have no affect on the wet season flows, there is no impact to the floodplain management for this reach of Mill Creek. Also since the flow increase is below the normal wet season runoff flows, the increase during dry seasons would not affect any wetland habitat.

Environmental Consequences

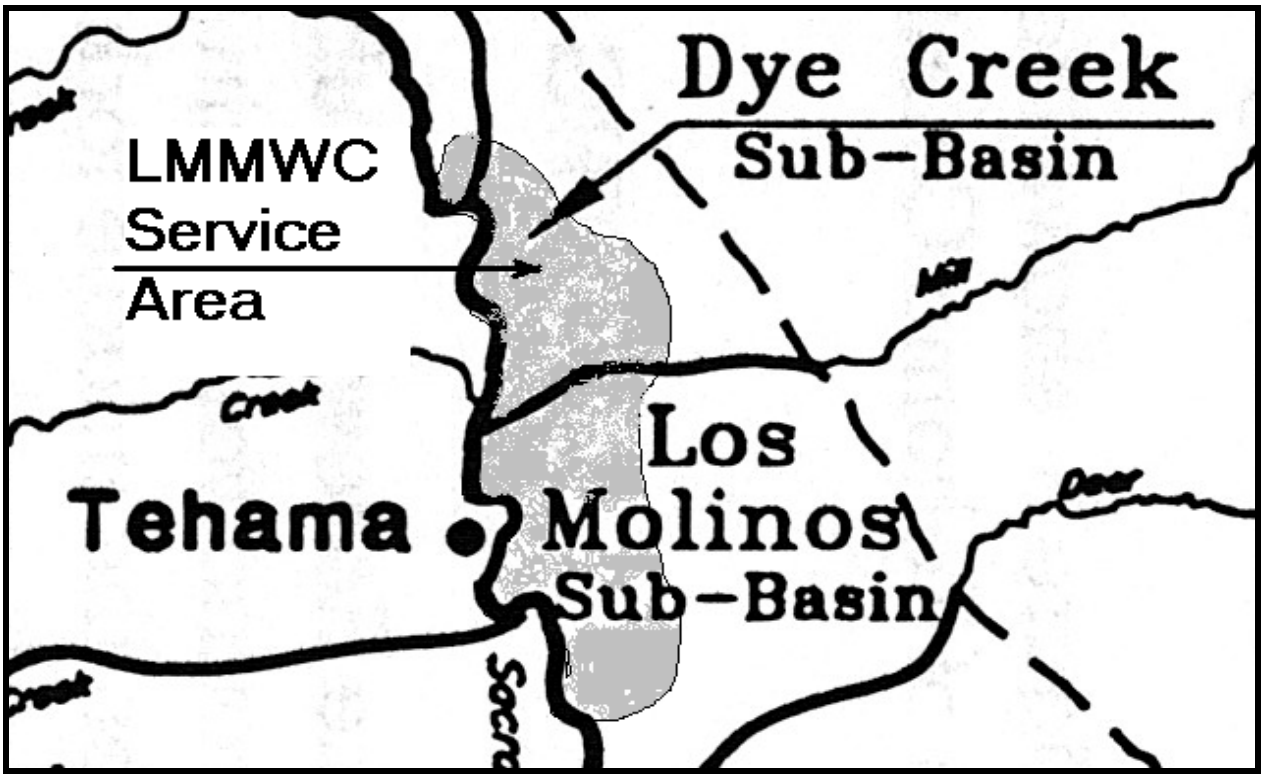
The No-Action Alternative would have no effect on the current target in-stream flow of 25 cfs for the April through June period in the project area between Ward Dam and the confluence of the Sacramento River as long as the existing agreements remain in place. The Proposed Action would increase the base instream flow below Ward Dam from 25 cfs to as much as 40 cfs for the months April through June and October. The increased base in-stream flow would help enhance migration and passage habitat conditions for spring-run and fall-run chinook salmon. The Proposed Action is a step towards achieving the AFRP target instream flow of 157 cfs or 57 cfs depending on whether or not riffle modifications are made, as recommended by the USFWS (USFWS, February 2002). The LMMWC and CDFG lease water from a Mill Creek water right holder would remain in effect. The current use of the leased water to provide additional in-stream flows to enhance salmon migration in lower Mill Creek would not be changed.

There would be no floodplain management or wetland impacts associated with the Proposed Action or No-Action Alternatives.

### 3.1.2 Groundwater

Affected Environment

The LMMWC service area is in Sacramento River Groundwater Basin. The Mill Creek Watershed boundaries encompass three key areas noted in the Tehama County Groundwater Management Plan. Mill Creek is assumed to act as a boundary relative to regional groundwater movement. Therefore, the groundwater basin underlying the LMMWC service area is divided into two groundwater sub-basins of the Sacramento River Groundwater Basin, the Los Molinos Sub-basin and the Dye Creek Sub-basin. The groundwater flow in these areas is westerly from Mill Creek and Deer Creek toward the Sacramento River. The upland areas of the watershed fall within the "Eastern Tuscan Formation Highland Area."




**LMMWC Service Area Groundwater Sub-Basins**

The Los Molinos Sub-basin is bounded on the north by Mill Creek and on the south by Deer Creek (both groundwater recharge boundaries), on the east by the Chico Monocline, and on the west by the Sacramento River. Groundwater flow is westerly from Mill and Deer Creeks toward the Sacramento River. The LMMWC service area of the basin contains an unconfined groundwater body. This is the basin from which the water right holders selling their water right will convert to on-site wells for irrigation water.

The Dye Creek Sub-basin is bounded on the north by Antelope Creek, on the south by Mill Creek, on the east by the Chico Monocline and on the west by the Sacramento River. The LMMWC service area of the basin contains confined, composite or unconfined groundwater bodies, depending on location.

An AB 3030 Groundwater Management Plan coordinated by the Tehama County Flood Control and Water Conservation District regulates the groundwater in Tehama County. Also Tehama County has enacted Ordinance 1617, establishing Tehama County Aquifer Protection. The primary purpose of the plan is to prevent long-term overdraft of groundwater within the plan area and to balance long-term average annual replenishment with extraction and other losses to the basin as may be consistent with the public interest of the plan area population. The Ordinance prohibits the mining of groundwater and requires County permits for the installation and operation of any groundwater well installed for extraction of groundwater for off-site use. The objective of Tehama County is to protect

the County's groundwater supply and quality to provide local users with a reliable long-term water supply.

LMMWC Area Groundwater Monitoring

CDWR issues periodic reports that relate to the monitoring program in Tehama County. These reports include groundwater hydrographs for the monitored wells. The most recent report "Groundwater Levels in the Sacramento Valley Groundwater Basin, Tehama County" was released by CDWR in late 1993 (CDWR 1993). Most wells in the monitoring program are measured by CDWR semiannually, usually in March and October. This provides an indication of groundwater levels before and after the irrigation season. In addition to recording water levels, the CDWR 1993 report also includes, for each well, information on the producing aquifer(s), degree of certainty associated with the groundwater body classification, the hydro geologic unit, and the applied use of the groundwater. Tehama County Flood Control and Water Conservation District also closely monitors the groundwater levels.

Historic Variations in Groundwater Levels

Groundwater levels in the LMMWC service area fluctuate on an annual basis due to extraction operations, infiltration and downward percolation from precipitation, surface water sources and irrigation, and subsurface inflows and outflows. Monthly measurements of groundwater show that spring water levels start dropping when irrigation begins (usually April) and continue to decline until about mid-July. Later in the summer, starting in late August to early September, levels begin to rise steadily. Maximum levels are usually reached by February. The groundwater levels in this area show an approximate seasonal variation of less than 10 feet throughout the year.

There are eleven wells currently monitored by CDWR in the LMMWC service area. Eight wells in Townships 26 and 27, Range 2, are in the Dye Creek Sub-basin. Three wells in Township 25, Range 2, are in the Los Molinos Sub-basin. The well qualifications for the eleven wells are shown in Appendix IV, Table 1

Annual groundwater level hydrographs for each of the eleven wells in the LMMWC service area are provided in Appendix IV. The wells are arranged in order from north to south. Composite groundwater level hydrographs of the eleven wells for the following years are also shown in Appendix IV:

- 1965 (early year with five wells measured and an average runoff year on Mill Creek)
- 1977 (very dry runoff year on Mill Creek)
- 1992 (recent dry runoff year on Mill Creek)
- 1994 (recent dry runoff year on Mill Creek)
- 1998 (recent above average runoff year on Mill Creek)

Based on the annual groundwater level hydrographs of the wells in the Los Molinos Sub-basin, the water levels from March to October were found to vary less than 10 feet. The water elevations in

October for the wells varied less than 5 feet for all the years shown. Based on the annual groundwater level hydrographs of the wells in the Dye Creek Sub-basin, the water levels from March to October were determined to vary less than 10 feet. The water elevations in October for the wells varied less than 10 feet for all the years shown.

The 1998 spring water level in well 25-02-21B01M in the Los Molinos Sub-basin is encroaching into the crop root zone. The 1998 spring water level in well 26-02-29R02M in the Dye Creek Sub-basin is also encroaching into the crop root zone

Historic Groundwater Pumping

In the earlier decades of this century, Tehama County used little groundwater. The Sacramento River and its primary tributaries provided the source for most irrigation water used in the County. Many parts of the County have experienced artesian wells in past years. Groundwater use was small but important during the 1950's. Twenty years later, approximately 1/3 of all irrigation water came from groundwater and 2/3 came from surface water sources. The 1990s reversed this ratio. The main reason for the change is a shift from pasture and row crops to permanent orchard crops. The orchard crops require a more reliable and timely source of water than the existing surface water distribution system can deliver. Further, all water supplies for municipal, domestic and industrial uses are supported by extracted groundwater. Even though more landowners are turning to groundwater because of the orchards' requirement for a more reliable and timely water source the overall groundwater supply has remained stable.

Known Groundwater Quality Problems

For the most part, Tehama County groundwater is of excellent quality. However certain areas of the County have experienced water quality problems. The groundwater quality for orchard crop production in the LMMWC service area Dye Creek and Los Molinos Sub-basins is not a problem. Landowners who have installed wells for crop production have not experienced any water quality problems. Wells 26N02W14G01M and 26N02W22G01M on the east side foothill portion of the LMMWC service area in the Dye Creek Sub-basin have concentrations of boron and sodium which could harm crops if not blended properly with surface water. If any well installed under the Proposed Action were to have concentrations of boron and sodium that are unsuitable for irrigation purposes or if the pumping is found to cause unmitigable adverse effects, pumping would be stopped. Similar restrictions are in the LMMWC, DCFG and CDWR Exchange Agreement. The LMMWC, CDFG and CDWR groundwater exchange agreement would remain in effect. The current operation of the groundwater exchange program would not be changed. Any new wells installed, as a result of this project would meet the requirements of Tehama County ordinances. The well's uppermost perforations would start at a minimum of 150 feet below ground surface to prevent pumping Mill Creek and Sacramento River subflow.

Environmental Consequences

The No-Action Alternative would have no effect on any existing groundwater supply and quality. Implementing the Proposed Action could increase both the amount of water flowing in Mill Creek

and the use of groundwater, as compared to the No-Action Alternative. The Proposed Action could increase groundwater use up to approximately 1,000 acre-feet per year (3.4 acre feet per acre on 300 acres associated with OCID's water right). This increased use would have very little effect on the groundwater supply and quality. The well groundwater level hydrographs show that the groundwater supply recovers very quickly from dry years and annual use. This indicates that the groundwater supply use is less than the safe yield of the sub-basins in the LMMWC service area.

New groundwater wells required as a result of the Proposed Action would be installed and operated in accordance with the Tehama County Aquifer Protection Ordinance and Tehama County Flood Control and Water Conservation District coordinated AB 3030 Groundwater Management Plan. The well would also be installed to prevent it from pumping Mill Creek and Sacramento River subflow.

### 3.1.3 Geology and Erosion

Affected Environment

Geologic formations within the Mill Creek Watershed consist primarily of Cascade Range volcanic formations. The headwaters of the creek lie on the volcanic south slopes of Lassen Peak. The predominate formation in the watershed consists of volcanic flows of basalt and andesite with some volcanic mudflows.

The topography of the stream basin can be divided into three distinct zones. The upper and middle reaches are dominated by steep terrain, and stream channels located in sheer gorges or steep canyons. The lower reach is relatively flat, sloping gently to the Sacramento River. There are numerous springs flowing into the upper and middle reaches of the creek, indicating that groundwater flows are concentrated in some ancient stream channels buried by lava flows.

The erosion potential in the Mill Creek Watershed is driven by slope and soil type. The predominant soil type is derived from volcanic rocks. In general there is moderately low erosion potential in the basin. Much of the foothill reach of the watershed is not particularly erodible due to the lack of deep soil overlying the pavement-like lava flows and the flatter plateaus that predominate this portion of the basin. Therefore, an increase in erosion is not anticipated under the Proposed Action or the No-Action Alternative because of the presence of volcanic erosion resistant rock and the lack of soil overlying the rock.

Environmental Consequences

No changes in land use and hence no affects on geologic formations or soil erosion would occur under the proposed project.

## 3.2 Biological Resources

### 3.2.1 Fisheries

Affected Environment

Mill Creek provides habitat to steelhead, and fall-/late-fall and spring-run chinook salmon (CDFG 1997a), and arguably is the least modified salmonid spawning stream in California.

Assessing the performance of salmon in this stream, which has remained unchanged for a century or more, allows the project to assess the relative importance of restoration efforts of nonspawning habitat by removing changes in spawning habitat as a confounding variable. This provides essential data for assessment of the cost-effectiveness of restoration actions. It is obvious that high quality spawning habitat is critical to salmonid survival, but the declines in the Mill creek populations, despite the lack of change in its quality, demonstrates the importance of nonspawning habitats. Maintenance of the quality of Mill Creek as spawning habitat would give interested parties the ability to evaluate the efficiency of restoration actions in the rest of the system without the uncertainties that would be introduced by having both the spawning and nonspawning environments change simultaneously. Maintenance of the quality pf the habitat quality is therefore important to management of fisheries resources and evaluation for the Ecosystem Restoration Program as a whole.

In-stream flows in Lower Mill Creek, below the Ward Dam, play a vital role for salmonids entering Mill Creek from the confluence of the Sacramento River. Low flow conditions appear to contribute to migration delay, stress, pre-spawning mortality, and straying. The AFRP (USFWS 1995 & 1997) objective for action to improve transportation flows in the valley reach of Mill Creek is to ensure that upstream migrating spring-run adult chinook salmon, downstream migrating spring-run juvenile salmon and fall-run adult chinook salmon can migrate safely through the lower portion of Mill Creek.

The channel of the lowermost 2.5 river miles of Mill Creek is incised under low flow conditions. It exhibits numerous critical riffles that impede salmonid fish passage. Moreover, at the confluence with the Sacramento River, bars form as a result of seasonal flow variability.

Environmental Consequences

Under the No-Action Alternative, in-stream flows at Ward Dam would decline to zero at certain times of the year. The Proposed Action, as compared to the No-Action Alternative would further enable improved fish movement and help prevent stranding and isolating of various life stages of chinook salmon populations. The Proposed Action would help enhance management of in-stream resources to provide environmental cues and appropriate hydrologic conditions for successful fish passage. These flows would also assist with maintenance of riparian corridor in lower Mill Creek and may create habitat for riparian native species and production of insects that are beneficial to salmonids.

### 3.2.2 Vegetation

Affected Environment

The Mill Creek watershed supports diverse vegetative communities that change markedly between the valley floor and the headwaters. Unvegetated slopes and alpine dwarf shrub, communities

comprised of species that can survive in areas that are snow covered for most of the year, occur at the highest elevations, at the boundary of the watershed. Red fir *(Abies magnifica*) and other high altitude conifers occur near the headwaters. Ponderosa pine (*Pinus ponderosa*) is adjacent and further down the canyons.

The upper escarpment in the watershed is thus primarily mixed conifer with some montane chaparral. The lower escarpment contains a mixture of montane chaparral and montane hardwood-conifer. Proceeding downstream, the canyon slopes are characterized by blue oak (*Quercas douglasi*) and foothill pine woodlands, while riparian vegetation is present along the stream. Riparian plant species in this area include black cottonwood (*Populas trichocarpa*), white alder (*Alnus rhombifolia), w*illows *(Salix*, spp.) and elderberry bushes *(Sambucus*, spp.) As the stream approaches the valley floor, annual grasslands begin to predominate with some occurrences of vernal pools. The canyon floor becomes wider and contains pockets of large riparian vegetation. The area below the Upper Dam has had some conversion to irrigated cropland and orchards. Remnants of native vegetation remain as narrow strips of riparian woodland along the creek in this reach.

Environmental Consequences

The No-Action Alternative would not have any effect on vegetation in the project area. Implementing the Proposed Action would increase the amount of water flowing in Mill Creek below Ward Dam, but the increased flow would have very little effect upon the riparian area along the 2.5 miles of Mill Creek between Ward Dam and the confluence of the Sacramento River.

### 3.2.3 Wildlife

Affected Environment

The wildlife of the Mill Creek watershed is diverse, corresponding to the diversity of habitat types. The upper elevation reaches are characterized by conifer-dominated habitats with chaparral, blue oak woodland, and riparian vegetative types predominating as elevation decreases. Common mammal species inhabiting this area include black bear (*Ursus americanus),* mountain lion *(Felis concolor*), deer (Cervidae, spp.), coyote *(Canus latrans*), raccoon (*Procyon lotor*), bobcat *(Felis rufus*), squirrels (Sciuridae, spp.) and a number of smaller mammals (CDFG 1997)). Specifically, the riparian area may provide habitat for the long-tailed weasel *(Mustel afteneta),* river otter (*Lutra canadensis),* and muskrat *(Ondatra zibethicus).*

Avian species which may utilize the area include the bald eagle *(Haliaeetus leucocephalus), a* Federally-listed threatened species, California valley quail (*Callipepla californica*), wild turkey (*Meeagris gallopavo*), great blue heron (*Ardea herodias*), golden eagle (*Aquila chrysaetos),* scrub *jay (Aphelocoma coerulescens),* canyon wren (*Catherpes mexicanus*), red-tailed hawk (*Buteo jamaicensis),* American kestrel (*Falco sparverius*), northern harriers (*Circus cyaneus*), turkey vultures *(Cathartes aura),* and acorn woodpeckers (*Melanerpes formicivorus*). In addition, migratory waterfowl utilize the area.

Some amphibians and reptiles common in riparian areas are the gopher snake (*Pituophis melanoleucus),* western rattlesnake (Crotalus species*),* western fence lizard (*Sceloporus occidentalis),* a variety of garter snakes, bullfrog, western pond turtle (*Clemmys marmorata*) and Pacific tree frog (*Hyla regilla*). In addition, the foothill yellow-legged frog *(Rana boylii*) and the red-legged frog *(Rana aurora*)*,* a federally listed threatened species, are amphibian species that have the potential to occur within the watershed.

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus)* is a Federally listed threatened insect and a State species of concern that requires elderberry bushes for larval and adult life cycles. Elderberry bushes are present in the riparian area within the watershed.

Environmental Consequences

The No-Action Alternative would have no effect on any existing wildlife in the project area between Ward Dam and the confluence of the Sacramento River. Overall, the Proposed Action has the potential to enhance habitat for stream dependent wildlife as compared to the No-Action Alternative. The consequences of the proposed flow increase on the terrestrial environment are confined to the riparian habitat found in the lower reaches of the Mill Creek system. Riparian habitats have exceptionably high value for many wildlife species (Thomas 1979, Marcot 1979, Sands 1977). Such areas provide water, thermal cover, mitigation corridors and diverse nesting and feeding opportunities. The range of wildlife that uses this habitat for food, cover and reproduction include the amphibians, reptiles, birds and mammals identified in the "Affected Environment" discussion of this section.

The primary effect of the in-stream flow increases would be to increase the production of anadromous fish by facilitating passage to and from spawning grounds and enhancement of rearing habitat in the lowermost 2.5 river miles. This increase in production would beneficially affect other species because fish are an important part of the ecosystem in Mill Creek, especially salmon that have the capability to add tremendous biomass to the system due to rich feeding grounds at sea. Fish provide an important food source to riverine dependent wildlife such as fish eating mammals and birds.

Increasing in-stream flows below Ward Dam primarily represent dry season flow increases since wet season flows typically exceed these values. Since the flow increase would be below the normal wet season runoff flows, the increase during dry seasons would not cause loss of riparian habitat due to bank erosion or scour.

The species of terrestrial vertebrates that occur in riparian habitat are expected to respond positively to the improvements in the vegetation, increased wetland areas and more abundant food supply. There are 249 species that could potentially be found in the montane riparian habitat on Mill Creek, according to the Wildlife Habitat Relationship Analysis (CDFG 1997b) for the biologically similar Battle Creek watershed.

### 3.2.4 Threatened and Endangered Species

The Proposed Action affects species associated with riparian and aquatic habitats of the stream. The Federally listed species associated with the~~se~~ habitat types within the Mill Creek watershed are bald eagle, spring-run chinook, steelhead trout, red-legged frog and the Valley elderberry longhorn beetle. Proposed listing status is associated with fall-run and late-fall run chinook. It is possible that listed winter-run salmon may stray into lower Mill Creek or use it as rearing habitat.

Affected Environment: Bald Eagle (*Haliaeetus leucocephalus)*

The bald eagle was previously a federally listed endangered and state listed endangered species, as a result of a severely declining population. The bald eagle, however, was reclassified as Federally threatened within the last few years. Historically, declines in bald eagle populations resulted from uncontrolled shootings by humans, contamination of prey by pesticides and loss of habitat. Currently, human disturbance and habitat losses are probably the most significant threats to eagles (CDFG 1997b). The reported number of known bald eagle nesting territories in California has increased steadily over the past 15 years and is now being delisted.

Bald eagles are predatory birds that rely mostly on fish; however, they are opportunistic and will feed on birds, mammals and carrion if readily available. They require large bodies of water or free flowing streams with abundant fish and adjacent snags or perches for hunting (CDFG 1997b). Bald eagles may feed gregariously in groups, especially on spawning fish, by swooping from perches or soaring flight to pluck fish from the water.

Bald eagle wintering areas are generally near rivers, especially around riparian areas, so that the eagles may forage in marshy areas or open water for fish and waterfowl. Breeding from February through July in California, with peak activity from March to June, bald eagles usually nest in the same territories each year and often repair and reuse the same nest, adding new materials to it each year (USFWS 1997b). There is a nesting territory several miles upstream of Ward Dam near the point where Mill Creek leaves the foothills and enters the valley. Optimal nesting habitat is characterized by availability of live or carrion prey, the presence of suitable nest sites, and minimal human disturbance (Peterson 1986).

Environmental Consequences: Bald Eagle

The No-Action Alternative will have no effect on bald eagles. Pursuant to informal consultation with the USFWS, the Proposed Action would have little or no effect on the bald eagle's habitat and is not likely to adversely affect the bald eagle.

Affected Environment: Sacramento River Winter Run ESU (*Onchorhynchus tshawytscha*)

The winter-run chinook salmon was Federally listed as endangered on January 4, 1994 (59 FR 440) and State-listed as endangered in May 1989 (California Code of Regulation, Title XIV, Section 670.5). Critical habitat for this species was listed from Keswick Dam to the Golden Gate Bridge on June 16, 1993 (58 FR 33212). Although Mill Creek was historically in the range of winter-run chinook (Yoshiyama, et al. 1995), it is currently not designated as critical habitat due to the absence of the species at this time.

The NMFS Proposed Recovery Plan for the Sacramento River winter-run chinook salmon discusses the appropriateness of Mill Creek. Objective 3 of the proposed recovery plan is to evaluate re-establishing additional natural winter-run chinook populations. Under this objective are two recommended actions: 1) conduct a feasibility analysis of establishing viable, naturally self-sustaining populations in other rivers and creeks within the Sacramento watershed and 2) based on information from the feasibility analysis, develop and implement recommendations for establishing supplemental populations. Under the first recommendation, two locations, Mill Creek and the Calaveras River, are suggested due to historical accounts of winter run chinook salmon (NMFS 1997).

Mill Creek would not be particularly promising but would be valuable, given the extremely low number of streams with any spawning habitat potential for the winter-run, to successfully reestablishing a winter-run population because drought resistant habitat is limited. The National Marine Fisheries Service (NMFS) is currently preparing studies to develop the criteria for reintroducing an acceptable founding population.

Environmental Consequences: winter-run chinook salmon (*Onchorhynchus tshawytscha*)

The No-Action Alternative would have no effect on winter-run salmon. Pursuant to informal consultation with the NMFS, the Proposed Action is not likely to either harm or benefit winter-run chinook salmon, which migrates when flows are naturally high in Mill Creek.

Affected Environment Central Valley Spring-Run ESU (*Onchorhynchus tshawytscha*)

The ESU's for Central Valley spring-run chinook salmon was Federally listed as endangered March 9, 1998 (FR 11482), and listed as threatened September 5, 1999. The rule states "the only streams considered to have wild spring-run chinook salmon are Mill Creek and Deer Creeks, and possibly Butte Creek (tributaries to the Sacramento River)." Spring-run chinook salmon are state-listed as endangered pursuant to the California Endangered Species Act, effective February 1999. OCID and USBR have initiated informal consultation relative to CESA requirements.

Environmental Consequences: spring-run chinook salmon (*Onchorhynchus tshawytscha)*

The No-Action Alternative may adversely affect spring-run chinook salmon if the current CDFG/CDWR in-stream flow lease and exchange agreements are terminated. The proposed action is likely to benefit spring-run chinook salmon.

Affected Environment Central Valley Fall/Late Run ESU (*Onchorhynchus tshawytscha)*

A proposed rule to list ESU's for Central Valley fall and late fall chinook salmon as threatened was proposed March 9, 1998 FR 11482). A decision on the proposed rule is under review.

Environmental Consequences: fall-run /late-fall-run chinook salmon (*Onchorhynchus tshawytscha)*

The No-Action Alternative may adversely affect fall and late fall chinook salmon if the current CDFG/CDWR in-stream flow lease and exchange agreements are terminated. The proposed action is likely to benefit fall and late fall chinook salmon.

Affected Environment: Central Valley Steelhead (*Onchorhynchus mykiss*)

Steelhead was Federally listed as a threatened species May 18, 1998 (63 FR 133247), which inhabits the Sacramento and San Joaquin Rivers and tributaries. NMFS has designated critical habitat February 5, 1999 that includes Mill Creek. Steelhead is also listed as threatened by the State. Historically, this species spawned and reared in the most upstream portions of the Upper Sacramento River and most of its perennial tributaries. However, agricultural and industrial water and land development has led to a 95% reduction (from 6,000 to 300 river miles) in spawning and rearing habitat (Reynolds 1993). Spawning in the Sacramento River takes place primarily from December through April, with most spawning from January through March (USBR 1997). As a result of modified and unnatural flow and temperature regimes throughout the basin, steelhead can now be found as adults in every month of the year (USBR 1997). Because natural spawning of steelhead in the Sacramento River system has been greatly reduced, steelhead is now highly dependent on hatchery production to maintain their populations.

As an anadromous species, steelhead migrate to sea as juveniles and typically return to inland waterways as two or four-year-old adults to spawn. Upstream migration occurs from August through March. Adult steelhead rarely feed while they are in freshwater. Unlike chinook and other Pacific salmon, steelhead trout do not necessarily die after spawning, and a small portion survives to become repeat spawners (USBR 1997).

The timing of upstream steelhead migration coincides with the timing of upstream migration of fall-, late fall-, and winter-run chinook salmon. Consequently, flow, water, temperature, and passage-related factors affecting upstream migration of adult steelhead in the Sacramento River system are similar to those affecting chinook salmon (USBR 1997).

Environmental Consequences: Steelhead

The No-Action Alternative may adversely affect fall and late fall chinook salmon if the current CDFG/CDWR in-stream flow lease and exchange agreements are terminated. The Proposed Action is likely to be beneficial to steelhead.

Affected Environment: Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus)*

The Valley elderberry longhorn beetle (VELB) was classified as a federally listed threatened insect species in 1980 (45 FR52803: August 8,1980). VELB is endemic to moist riparian woodlands along the margins of rivers and streams. This beetle requires elderberry bushes for both larval and adult life cycles. Any elderberry plant with one or more stems, measuring 1.0 inch or greater in diameter at ground level is considered habitat for the beetle.

During the past 150 years more than 90 percent of the riparian habitat in California has been destroyed by agricultural and urban development. Although the entire historical distribution of VELB is unknown, the extensive destruction of riparian forests of the Central Valley of California strongly suggests that the beetle's range may have shrunk and become greatly fragmented (USFWS Species Account and Environmental Database).

Environmental Consequences: Valley Elderberry Longhorn Beetle

Elderberry bushes are present in the riparian area within the watershed. Pursuant to informal consultation with the USFWS, the Proposed Action would have little or no effect on the longhorn beetle's habitat and is not likely to adversely affect the Valley elderberry longhorn beetle.

Affected Environment: Red-legged Frog *(Rana aurora)*

The red-legged frog is a federally listed threatened species. USFWS designated critical habitat for the species in April 2001. The proposed critical habitat includes some portions of western Tehama County, but not the Mill Creek watershed. This frog is the largest native frog in the western United States, ranging from 1.5 to 5 inches in length. It has an olive or brown back and a reddish-colored belly and undersides of the hind legs. It lives mostly in wetlands and streams that have deep-water pools and dense stands of overhanging vegetation (USFWS 1996).

Today the red-legged frog has disappeared from 70% of its original range, and many of the remaining populations appear to be declining rapidly. It is known to occur in about 240 streams or drainage, primarily in the central coastal area of California. Only three areas within its historic range may currently support more than 350 adults (USFWS 1996).

Over the last two decades, scientists have noted a widespread decline of frogs and other amphibian species, the causes of which are not fully understood. However, the decline of the California red-legged frog is attributed to the spread of exotic predators such as bullfrogs, and the widespread habitat changes that have fragmented habitat, isolated populations, and degraded streams. Its decline signals a loss of diversity and environmental quality in wetlands and streams that are essential to clean water and to the survival of many fish and wildlife species (USFWS 1996).

The California red-legged frog was harvested for food in the San Francisco Bay area and the Central Valley during the late 1800's and early 1900's. About 80,000 frogs were harvested annually between 1890 and 1900. The market eventually dwindled as red-legged frogs became more rare, but the species continued to decline as agricultural and urban development eliminated its habitat. It was gone from the floor of the Central Valley by 1960. Remaining populations in the Sierra foothills were fragmented and later eliminated by reservoir construction, exotic predators, grazing and drought.

Environmental Consequences: Red-legged frog

The No-Action Alternative would have no effect on any existing red-legged frogs. Pursuant to informal consultation with the USFWS, the Proposed Action would have little or no effect on the red-legged frog's habitat and is not likely to adversely affect the red-legged frog.

## 3.3 Socioeconomic Factors

### 3.3.1 Agriculture

Affected Environment

Agriculture within the Mill Creek Watershed occurs below the mouth of the canyon on the valley floor. The area is arid and agriculture relies on irrigation to sustain production. The primary crops are prunes, almonds and walnut orchards throughout the area between Shasta Boulevard, about 1 ½ mile east of Highway 99, and the Sacramento River. In addition, there are irrigated pasturelands on some parcels in this area. These types of agriculture help to maintain larger parcels within the rural residential/suburban setting of Los Molinos. The water supply for irrigation in the area is provided by a water right Decree on Mill Creek and groundwater wells. The water quality of both surface water and groundwater has not been a problem to crop production in this area.

Agricultural use of groundwater use was small but significant during the 1950's. Twenty years later, approximately 1/3 of all irrigation water came from groundwater and 2/3 came from surface water sources. The 1990s reversed this ratio. The main reason for the change is a shift from pasture and row crops to permanent orchard crops. The orchard crops require a more reliable and timely source of water than the existing surface water distribution system can deliver. Even though more landowners are turning to groundwater because of the orchards requirement for a more reliable and timely water source the overall groundwater supply has remained stable.

Environmental Consequences

The No-Action Alternative would have virtually no effect on the agricultural production in the area. The Proposed Action would neither increase or take any productive cropland out of production nor reduce its productivity. Either course of action would be locally beneficial and protective of the County's tax base, preventing the creation of adverse economic impacts.

The increased use of groundwater will help maintain the high groundwater levels at a more desirable distance from the ground surface than is now the case at two of the monitored wells in the area. Adequate crop production and perpetuation of soil fertility in irrigated areas require water table depths of 6-foot or greater below ground level. A groundwater table depth below 7 feet with temporary rises up to 6 feet, for a period no more than approximately 30 days per year is recommended by irrigation authorities and many financial institutions that are interested in long-time loans for improving irrigation lands (Israelsen 1956). Lowering the water table below the crop's 6-foot root zone provides a healthier root zone for crop production.

### 3.3.2 Energy

Affected Environment

Many farmers in the LMMWC service area irrigate their crops by wells. The wells use electricity and diesel fuel energy sources. The wells in the LMMWC service area are low consumers of energy due to the short pumping lifts to bring the water to the surface.

Environmental Consequences

The No-Action Alternative would have virtually no effect on the energy use in the area. Implementing the Proposed Action would require a small energy use increase in the area to pump up to a maximum quantity of approximately 1,000 acre-feet of additional groundwater and corresponding increase in pumping lifts.

### 3.3.3 Environmental Justice

Environmental Justice refers to the fair treatment of people of all races, income and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative environmental impacts resulting from the execution of environmental programs.

Environmental impacts associated with the Proposed Action and No-Action Alternatives would not fall disproportionately on minority and/or low-income members of the community. No adverse affect on farm workers would occur if the Proposed Action were implemented therefore because agricultural production would not be changed. Therefore, no environmental justice issues would be associated with either action.

## 3.4 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property rights held by the United States for Indian Tribes or individuals. Trust status originates from rights imparted by treaties, statutes, or executive orders. ITAs are lands, including reservations and public domain allotments, minerals, water rights, hunting and fishing rights, other natural resources, money or claims. Assets include real property, physical assets, or intangible property rights. ITAs cannot be sold, leased, or otherwise alienated without Federal approval. ITAs do not include things in which a tribe or individuals have no legal interest, such as off-reservation sacred lands or archeological sites in which a tribe has no legal property interest.

There would be no impacts associated with ITAs because they do not exist within the vicinity of the LMMWC facilities or along the banks of Mill Creek.

## 3.5 Cultural Resources

Section 10 of the National Environmental Policy Act, says the Federal Government is to “preserve important historic, cultural and natural aspects of our national heritage” and Section 106 of the

National Historic Protection Act, requires Federal agencies to take into account the effect of any Federal activity on cultural resources.

Because the Proposed Action does not involve the removal or modification of structural facilities and the changes in flows are within the natural range there would be no impacts to cultural resources.

**3.6 Cumulative Impacts**

According to section 1508.7 of the Council on Environmental Quality (CEQ) regulations, cumulative impact is defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The past actions of LMMWC, CDFG and CDWR to reduce diversions in an effort to improve in-stream flows on Mill Creek at Ward Dam have provided improved migration for spring-run chinook salmon anadromous fish species. However increased in-stream flow at Ward Dam is needed in addition to past actions to adequately provide migration for the spring-run chinook salmon. This action, combined with the Proposed Action would provide the increased in-stream flow at Ward Dam at a level that would greatly improve the fish passage below the Dam to the confluence of the Sacramento River.

The Proposed Action would increase both the amount of water flowing in Mill Creek and the use of groundwater, as compared to the No-Action Alternative. The Proposed Action could increase groundwater use up to a maximum quantity of approximately 1,000 acre-feet per year. This increased use would have very little effect on the groundwater supply and quality. The Proposed Action would neither increase or take any productive cropland out of production nor reduce its productivity. The face value of the acquired water right involved in this conversion would remain in Mill Creek.

New groundwater wells, if required as a result of the Proposed Action, would be installed and operated in accordance with the Tehama County Aquifer Protection Ordinance and Tehama County Flood Control and Water Conservation District's AB 3030 Groundwater Management Plan.

The Proposed Action of improving in-stream flows, in combination with other reasonably foreseeable future programs as funds from other sources are made available, would present the opportunity to help towards establishing a long-term solution to the Mill Creek fish passage problem and increase the spring-run chinook salmon population on Mill Creek. Ultimately, the Proposed Action, when combined with all other actions (past, present and future), would help to increase anadromous fish runs.

## 4. 0 MILL CREEK ENVIRONMENTAL ACTIONS

Mill Creek environmental actions are intended to monitor and mitigate for potential adverse environmental impacts associated with the Proposed Action. The following on-going environmental actions, conducted by other agencies, are associated with both the Proposed Action and No-Action Alternative.

- The CDFG would continue to monitor the responses of fishery resources to the Proposed Action.
- LMMWC and CDFG would continue to cooperate and coordinate the water operations on Mill Creek to enhance fish passage.
- CDWR would continue its groundwater level-monitoring program in the Sacramento Valley Groundwater Basin, Tehama County.

# 5.0 CONSULTATION AND COORDINATION

## 5.1 Consultation

This DEA has been prepared in accordance with the requirements of the NEPA of 1969, as amended. As part of the NEPA process, USBR is also complying with other applicable laws, including the Clean Water Act of 1977, the ESA of 1973, as amended, and the National Historic Preservation Act of 1966, as amended.

The process also includes complying with Executive Orders 11988 (Floodplain Management), 11990 (Protection of Wetlands), discussed in section 3.1.1, and 12898 (Environmental Justice), discussed in section 3.3.3.

The action proposed in this document is a joint activity of USBR and the USFWS and therefore, has met any consultation/coordination requirements that may exist pursuant to the Fish and Wildlife Coordination Act. The Proposed Action is consistent with provisions of the CVPIA in that it seeks to implement the Act in the Sacramento Valley under authority of Section 3409 (b)(3).

To satisfy requirements of the Endangered Species Act (ESA), USBR informally consulted with the USFWS and NMFS regarding the effects of the Proposed Action on Federally listed species, and developing specific compliance measures. Reclamation has requested the concurrence of USFWS and NMFS on the determination that the Propose Action would not likely adversely affect Federally-listed endangered species.

A draft FONSI is located in Appendix V.

## 5.2. Coordination

The following agencies and organizations were contacted during the preparation of this EA to obtain information or to review information contained in this document.

- U.S. Bureau of Reclamation – Lead Agency
- U.S. Fish and Wildlife Service – Cooperating Agency
- National Marine Fisheries Service – Cooperating Agency
- California Department of Fish and Game
- California Department of Water Resources

## 6.0 LIST OF PREPARERS

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| Richard Jewel, Hydrologist<br>USFWS, Central Valley Project Improvement Act Division | Review of EA |
| Harvey Williams<br>Consulting Engineer | Preparation of Initial Draft EA |

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## TERMS AND ACRONYMS

**AFRP** - Anadromous Fish Restoration Plan (under the Central Valley Project Improvement Act).
**Bay/Delta** - San Francisco Bay/Sacramento-San Joaquin Delta Estuary.
**CAMP** - Comprehensive Assessment and Monitoring Program.
**CDFG** - California Department of Fish and Game.
**CDWR** - California Department of Water Resources.
**CEQA** – California Environmental Quality Act.
**cfs** - Stream or canal flow expressed in cubic feet per second.
**CMARP** – Comprehensive Monitoring Assessment, Research Program.
**CVP** - Central Valley Project.
**CVPIA** - Central Valley Project Improvement Act.
**EA** –Environmental Assessment.
**Decree** - Tehama County Superior Court Decree of August 16, 1920, adjudicating Mill Creek water apportionments.
**ERP** – Ecosystem Restoration Program
**ESA** – Endangered Species Act.
**ESU** – Evolutionary Significant Unit.
**ITAs** – Indian Trust Assets.
**LMMWC** - Los Molinos Mutual Water Company.
**MCC** - Mill Creek Conservancy.
**Mill Creek** - The Tehama County stream that is the subject of this project.
**MCWMSP** – Mill Creek Watershed Management Strategy Program.
**NEPA** –National Environmental Policy Act.
**NMFS** – National Marine Fisheries Service**.**
**OCID** - Orange Cove Irrigation District.
**TNC** - The Nature Conservancy.
**USBR** - United States Bureau of Reclamation.
**USGS** - United States Geological Survey.
**USFWS** - United States Fish and Wildlife Service.
**VELB** –Valley Elderberry Longhorn Beetle.

# Appendices

- **Appendix I**: 1920 Mill Creek Court Decree
- **Appendix II**: LMMWC, CDFG, and CDWR Lease and Exchange Agreements

  -LMMWC and CDFG Mill Creek Water Right Lease Agreement

  -LMMWC, CDFG, and CDWR Water Exchange Agreement
- **Appendix III**: Mill Creek Annual Hydrology
- **Appendix IV:** Groundwater Well Hydrographs in Los Molinos Service Area

  -Plate 1: CDWR Map of Groundwater Well Locations

  -Table 1: Well Qualification for Tehama County Monitoring Wells

  -Hydrographs of Groundwater Wells in LMMWC Service Area
- **Appendix V:** Draft FONSI